

# Restoring Massachusetts Rivers: Habitat and Fluvial Fish

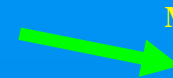
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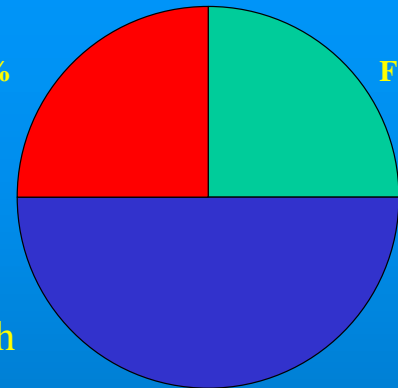
# Fisheries Habitat Conservation and Restoration Initiative

Target Fish Communities set Measurable Goals for Restoration (Mainstems)



MG 25%

FD 25%



Rivers Should Have River Fish

FS 50%



Habitat Mapping Sets Priorities for Restoration (Mainstems and Larger Tribs)

Indexes of Biotic Integrity Help Identify Local Issues (Small Streams)



# Developing a Target Fish Community – A Mainstem Method

Goal: “Define the fish community that is appropriate for a natural river in southern New England” (Bain and Meixler, 2000)

Assumption: Biological Integrity should be Maintained and is defined by “a balanced, integrated, adaptive community” (Karr, 1991)

Rivers Should Have River Fish Communities

# Rivers Should Have River Fish Communities

## What is a River Fish?



Brook Trout



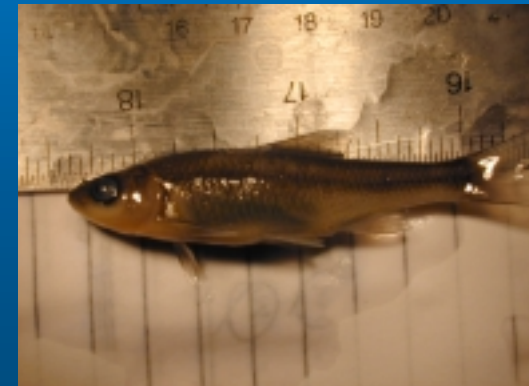
Fallfish



Creek Chubsucker

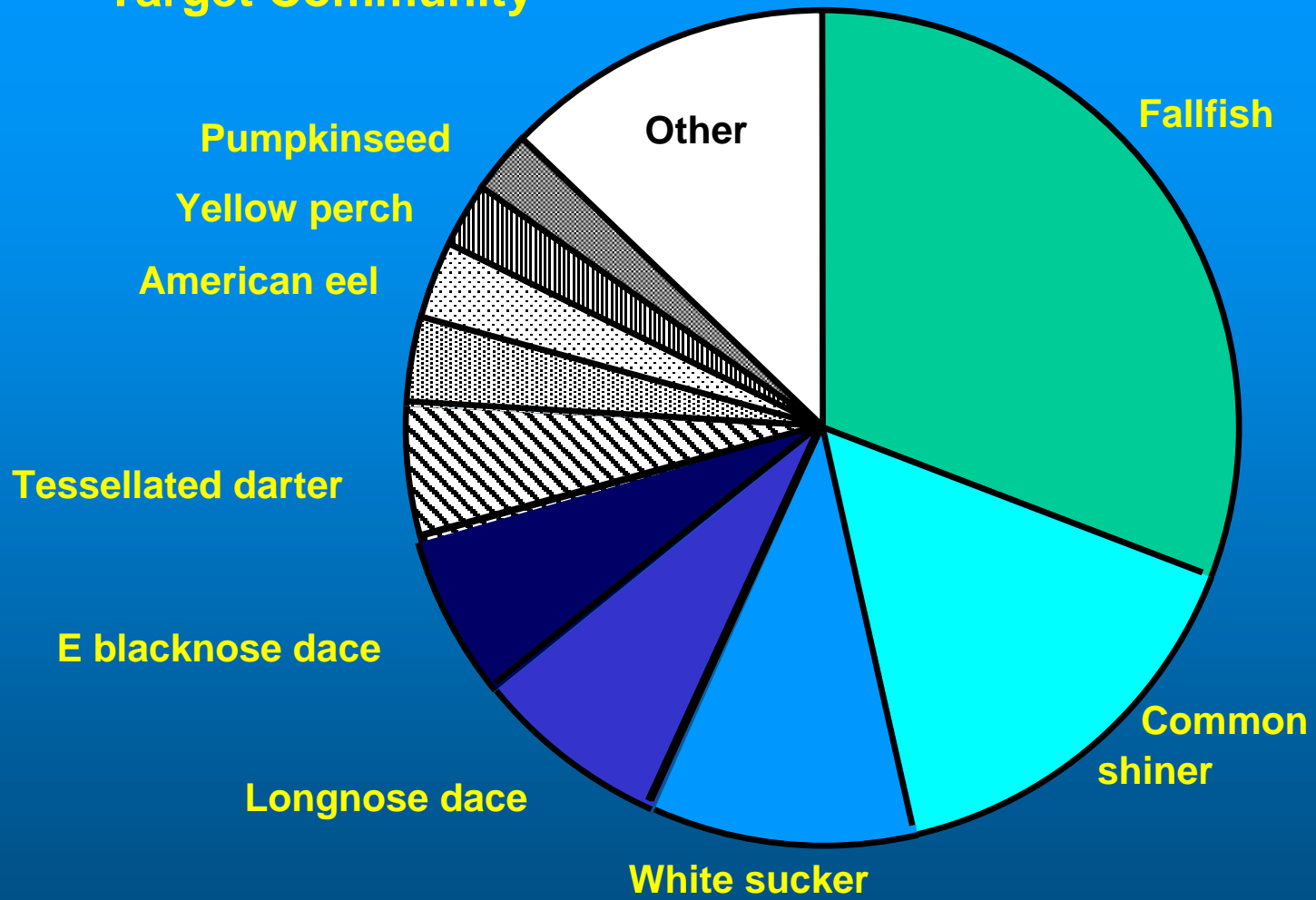


Tessellated Darter



Common Shiner

## Target Community



# Quinebaug Mainstem Target Fish Community

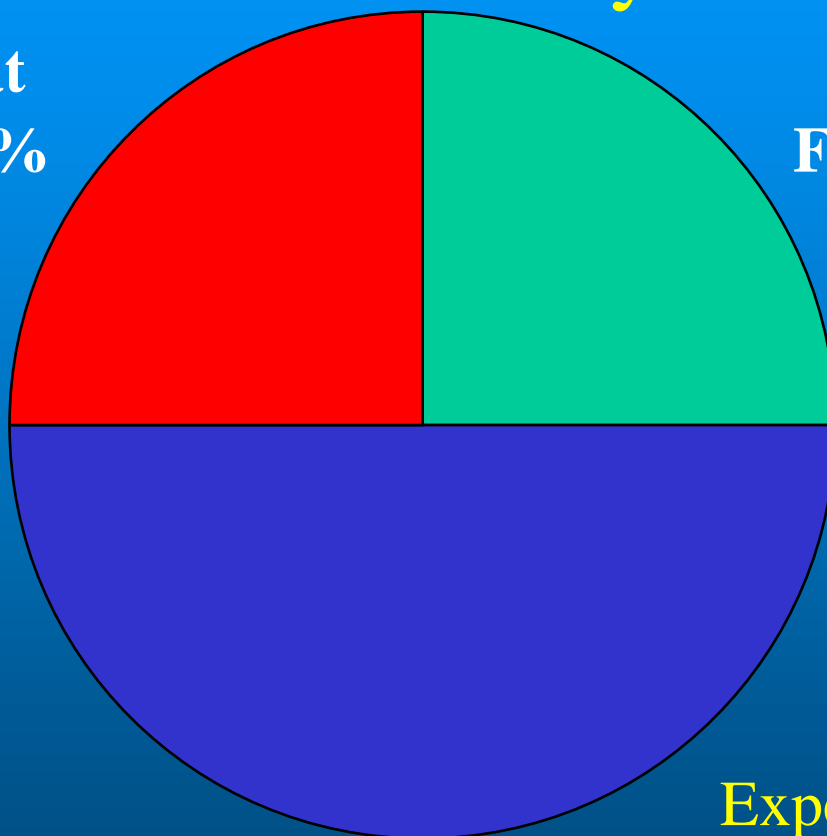
**Macrohabitat  
Generalist 25%**

**Fluvial Dependent  
25%**

**“Rivers Should  
Have River Fish  
Communities”**

**Fluvial  
Specialist 50%**

**Expected Condition  
When Biological  
Integrity is Maintained**



- Target Fish Communities Developed
  - Quinebaug
  - Ipswich
  - Housatonic
- Target Fish Community In Progress
  - Charles
- Target Fish Community Direction
  - Watershed by Watershed
  - Regionalization

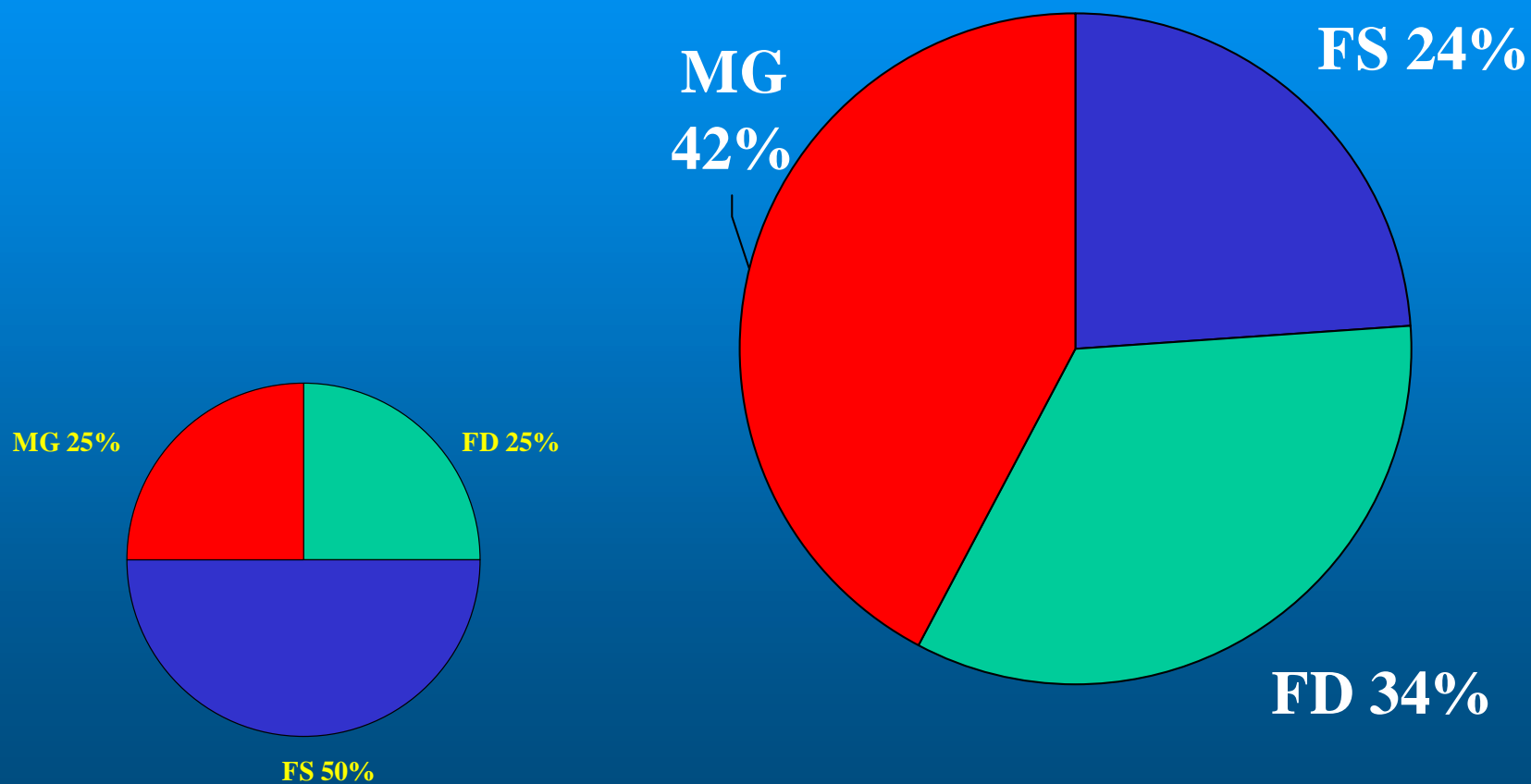
# Fish Community Assessment: Identifying the Current Status

- The Fish Tell the Story
  - Long-Lived
  - Reflect Stresses Over Time
  - Easily Recognized and Identified
  - Not Single Species Management





# Quinebaug Mainstem

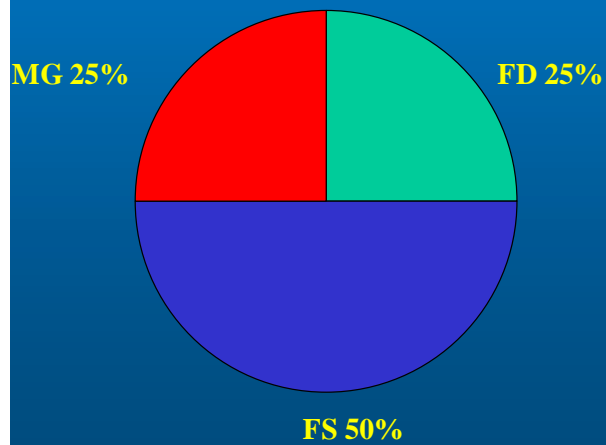


Observed

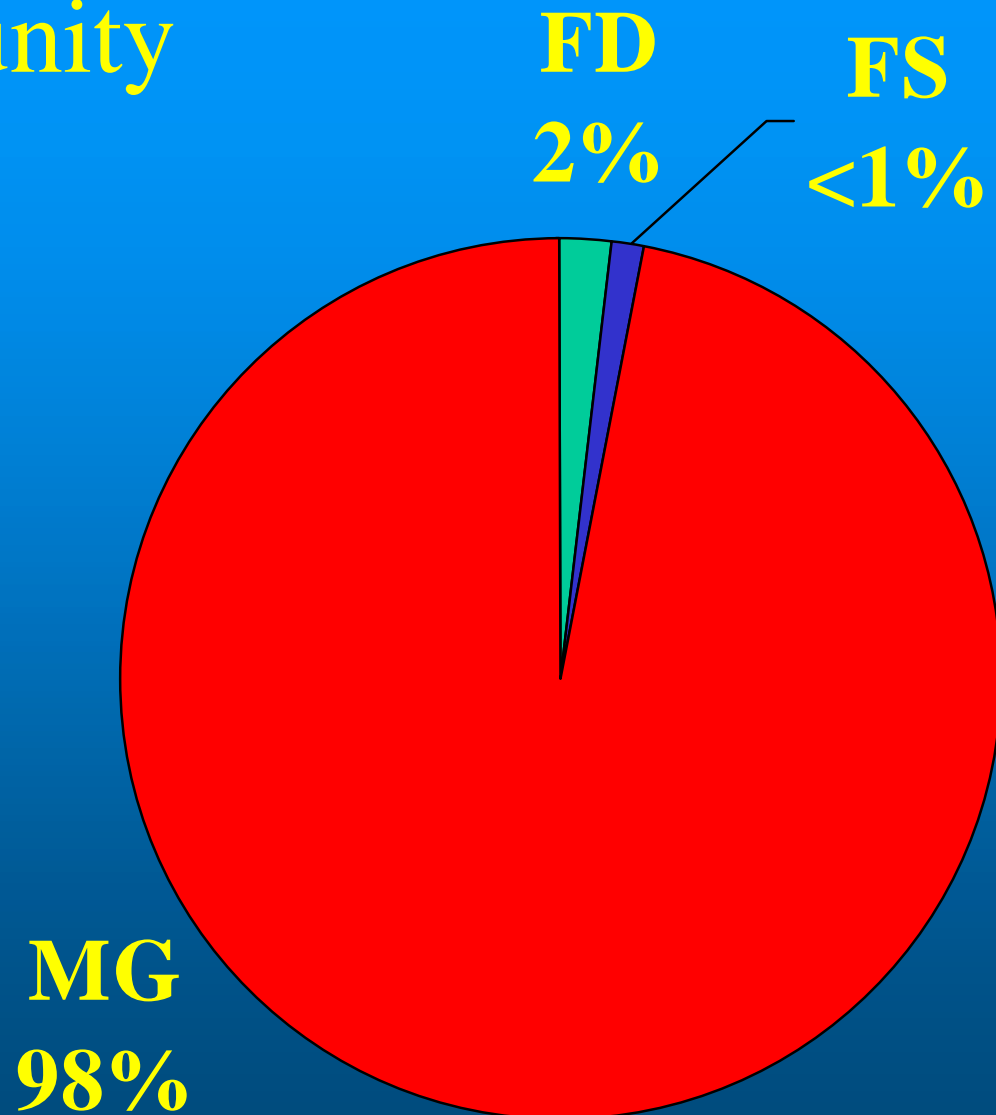
Target

Bain and Meixler, 2000

# Charles Fish Community



Quinebaug Target

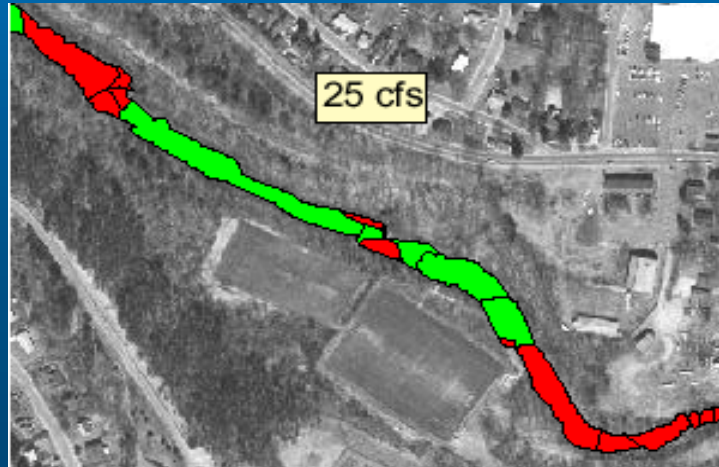


Charles Observed

# Habitat Mapping: Setting the Course for Restoration

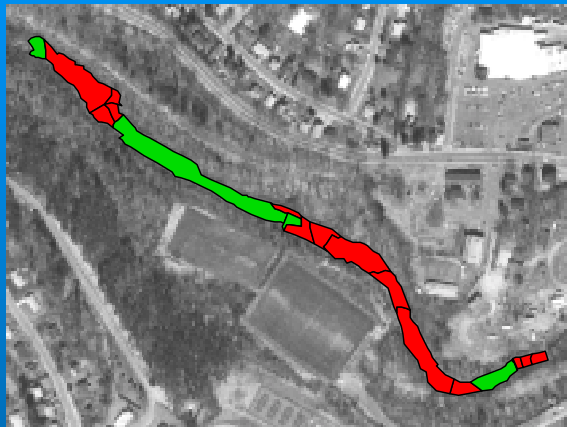


FALLFISH		
Presence (76% )		Beta
	BOULDER	1.95
	SHADING	-1.07
	DEPTH 0-25 cm	-1.76
	VELOCITY 45-60 cm /s	1.06
	RUN	-0.57
High abundance (60% )		
	Overhanging vegetation	-0.97



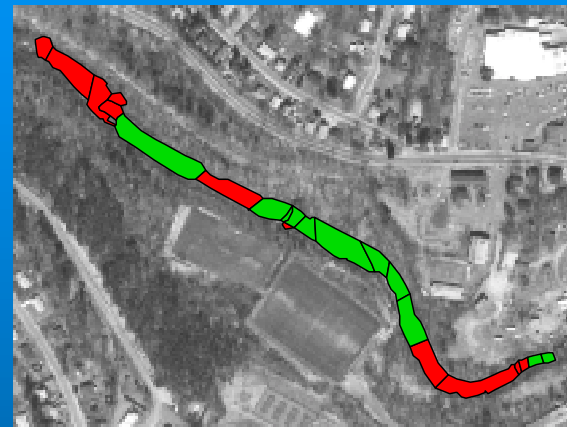
# Habitat Mapping: Setting the Course for Restoration

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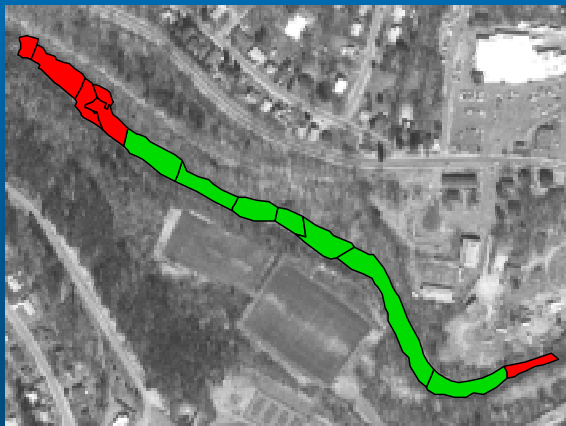
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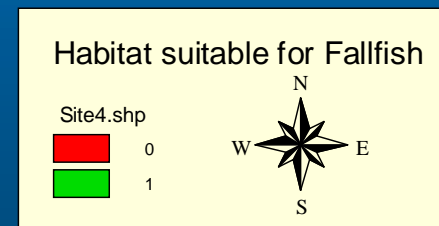
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1.0



1.0 cfs

Piotr Parasiewicz



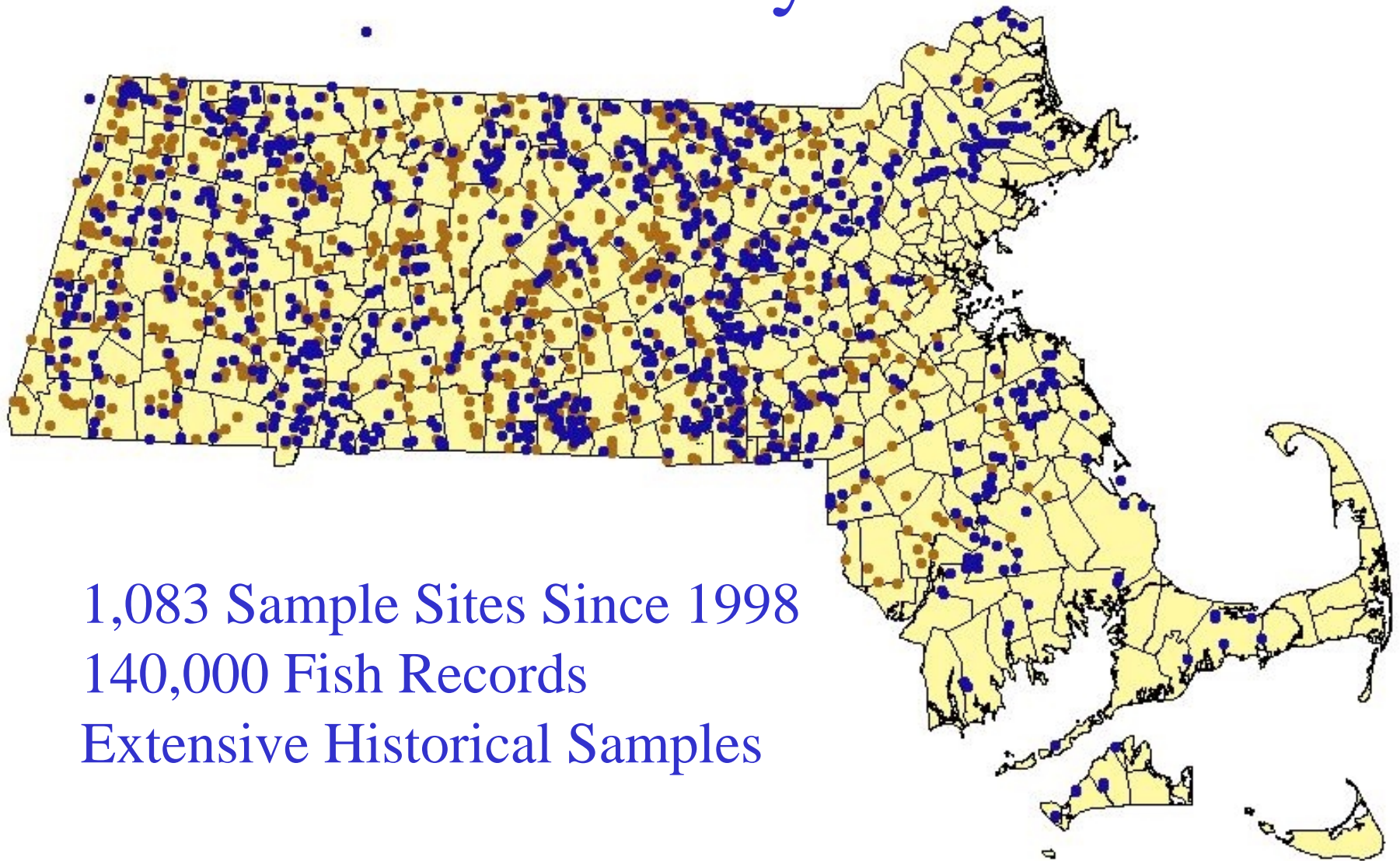
# Habitat Mapping: Setting the Course for Restoration

	Reach A	Reach B	Reach C	Reach D
Minimum flow	Red	Green	Red	Yellow
Impoundments	Red	Red	Red	Yellow
Temperature	Red	Yellow	Red	Yellow
Inst. flow fluctuations	Red	Red	Yellow	Red
Fish passage	Yellow	Yellow	Red	Yellow
Channel alteration	Green	Yellow	Green	Red
Flood plain dynamics	Blue	Yellow	Blue	Red
Embeddedness	Red	Yellow	Yellow	Red

# Indexes of Biotic Integrity: Small Scale for Small Streams

- Tributaries and Small Rivers
- Establish a Least Impacted Condition
- Determine Metrics to describe a Least Impacted Condition
- Score existing resources based on the Comparison

# MDFW Fish Survey



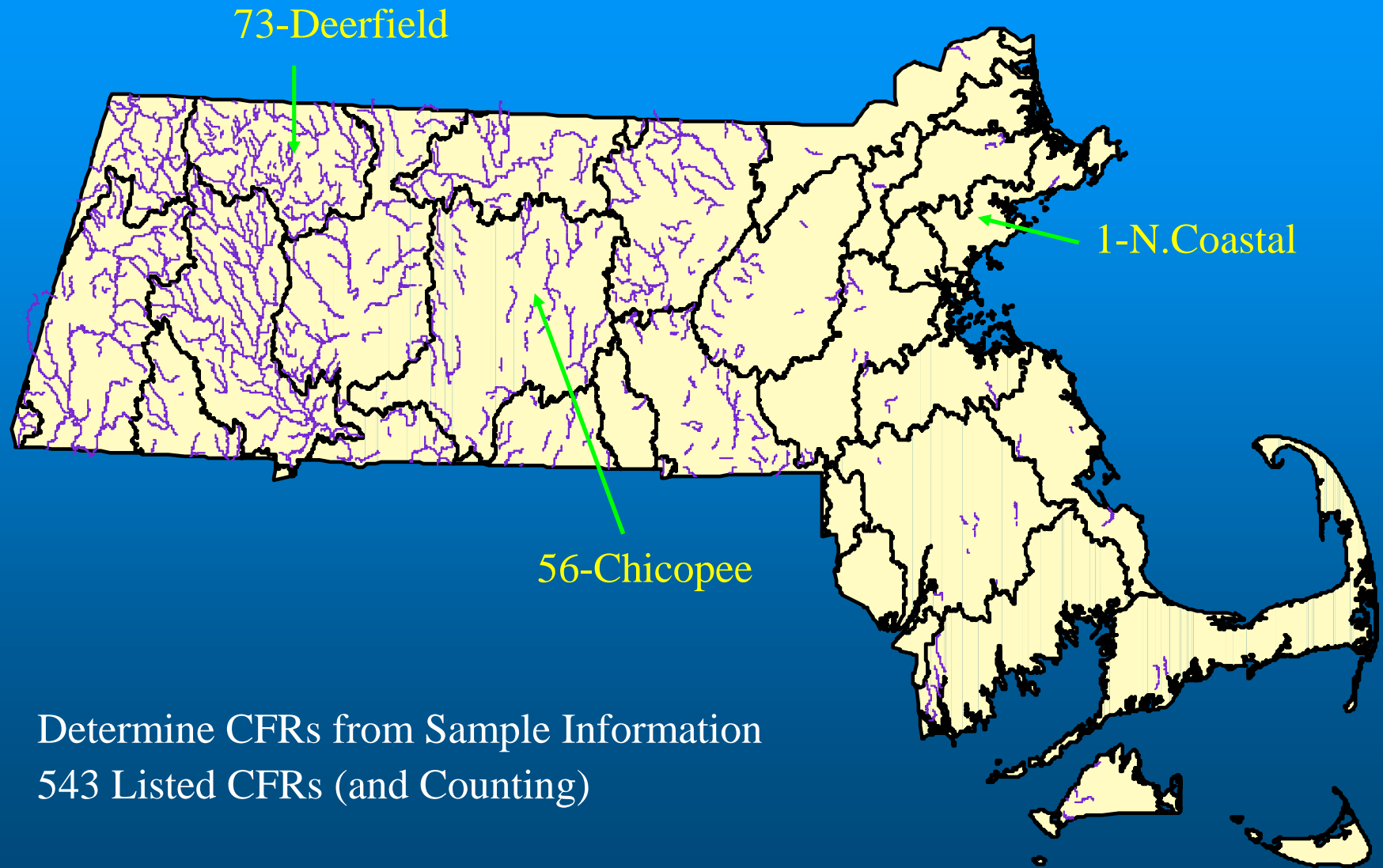
1,083 Sample Sites Since 1998  
140,000 Fish Records  
Extensive Historical Samples

# Applications

- Fisheries-Based Watershed Management Plans
- Coldwater Fishery Resource (CFR) Designations
- Water Quality Standards (DEP)
- USGS Publications
- State Wildlife Grants
- Sustainable Forestry
- NFHI/EBT Joint Venture

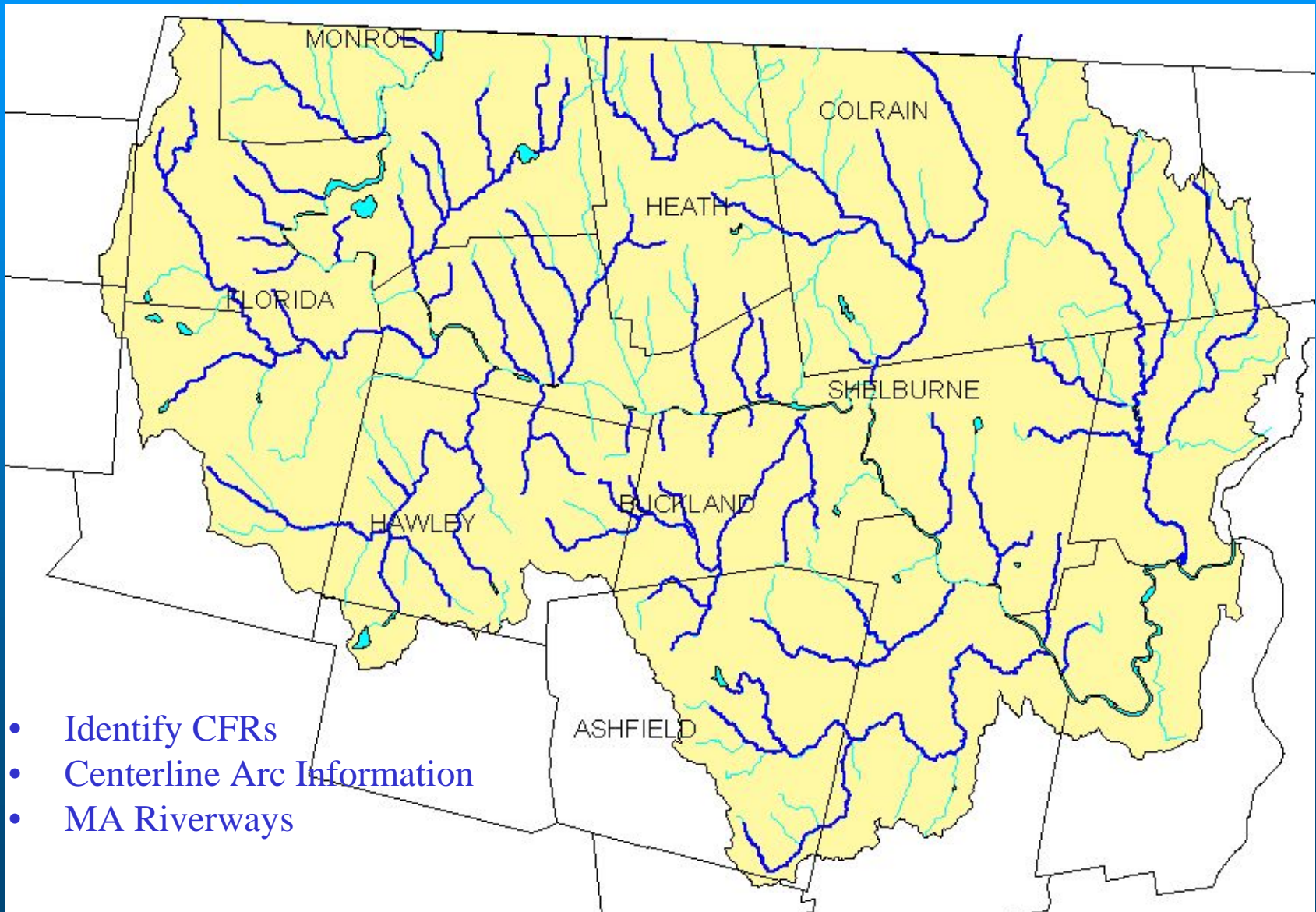


# Statewide CFRs



- Determine CFRs from Sample Information
- 543 Listed CFRs (and Counting)

# Deerfield Watershed



# Summary

- Habitat Restoration is the Key to Fisheries Management in Massachusetts
- Fish Sampling Allows the Assessment of the Current Condition
- Fisheries Habitat Conservation and Restoration Initiative Will Provide the Template for Action